

**WHAT IS CLAIMED IS:**

1. An image processing apparatus that converts first image data expressed in a first color system into second image data  
5 expressed in a second color system by referring to a color conversion table, said image processing apparatus comprising:

a color conversion table storage module that stores the color conversion table representing a mapping of second image data expressed in the second color system to multiple lattice points,  
10 at which first image data generated in a color space of the first color system and expressed in the first color system are registered, wherein the color conversion table is encoded and represents a mapping of encoded second image data to the multiple lattice points, where the encoded second image data are obtained by an encoding  
15 process, which enhances a variation in tone value of the second image data in a predetermined tone area in the first color system while compressing the variation in tone value of the second image data in a residual tone area;

an intermediate table generation module that makes the color  
20 conversion table subjected to a decoding process, so as to generate an intermediate color conversion table, where the decoding process restores the variation in tone value enhanced or compressed by the encoding process;

a color conversion table reconstruction module that  
25 specifies second image data corresponding to multiple lattice points, which are set to include at least different lattice points from lattice points included in the intermediate color conversion

table, based on the intermediate color conversion table and makes the specified second image data subjected to the encoding process, so as to reconstruct the intermediate color conversion table and generate a reconstructed color conversion table;

5           a color conversion module that refers to the reconstructed color conversion table to convert the first image data expressed in the first color system into encoded second image data, which has gone through the encoding process; and

          an image data decoding module that makes the encoded second  
10 image data subjected to the decoding process to cancel out the encoding process, thus specifying the second image data expressed in the second color system.

2. An image processing apparatus in accordance with claim  
15 1, wherein said color conversion module carries out the encoding process to enhance or compress the variation in tone value of the second image data, while keeping a magnitude order of the second image data.

20           3. An image processing apparatus in accordance with claim 1, wherein said intermediate table generation module comprises a decode table, which stores a mapping of the encoded second image data to the non-encoded second image data, and

          said intermediate table generation module refers to the  
25 decode table to convert the color conversion table and thereby generate the intermediate color conversion table.

4. An image processing apparatus in accordance with claim  
1, wherein said color conversion table reconstruction module  
reconstructs a color conversion table, which has a greater number  
of lattice points than the number of lattice points included in  
5 the intermediate color conversion table.

5. An image processing apparatus in accordance with claim  
1, wherein said image data decoding module makes the encoded second  
image data obtained by said color conversion module subjected to  
10 the decoding process as well as conversion into dot density data,  
which represents a dot formation density with regard to each of  
various dots having different tone values expressible by a unit  
dot.

15 6. An image processing apparatus in accordance with claim  
5, wherein said image data decoding module comprises a conversion  
table, which stores a mapping of the encoded second image data to  
the dot density data obtained by converting the non-encoded second  
image data, and

20 said image data decoding module refers to the conversion  
table to directly convert the encoded second image data obtained  
by said color conversion module into the dot density data.

7. An image processing apparatus in accordance with claim  
25 1, wherein the first color system is an RGB color system and the  
second color system is a CMY color system.

8. An image processing apparatus in accordance with claim 1, said image processing apparatus further comprising:

a detection module that detects a setting with regard to a priority order between a conversion accuracy of image data and a conversion speed; and

a prohibition module that prohibits operations of said intermediate table generation module when the setting gives priority to the conversion speed over the conversion accuracy,

wherein said color conversion table reconstruction module uses the stored color conversion table, instead of the intermediate color conversion table generated by said intermediate table generation module, to generate the reconstructed color conversion table, when the setting gives priority to the conversion speed over the conversion accuracy.

9. An image processing method that converts first image data expressed in a first color system into second image data expressed in a second color system by referring to a color conversion table, said image processing method comprising:

a first step of storing the color conversion table representing a mapping of second image data expressed in the second color system to multiple lattice points, at which first image data generated in a color space of the first color system and expressed in the first color system are registered, wherein the color conversion table is encoded and represents a mapping of encoded second image data to the multiple lattice points, where the encoded second image data are obtained by an encoding process, which

enhances a variation in tone value of the second image data in a predetermined tone area in the first color system, while compressing the variation in tone value of the second image data in a residual tone area;

5           a second step of making the color conversion table subjected to a decoding process, so as to generate an intermediate color conversion table, where the decoding process restores the variation in tone value enhanced or compressed by the encoding process;

10           a third step of specifying second image data corresponding to multiple lattice points, which are set to include at least different lattice points from lattice points included in the intermediate color conversion table, based on the intermediate color conversion table and making the specified second image data  
15           subjected to the encoding process, so as to reconstruct the intermediate color conversion table and generate a reconstructed color conversion table;

          a fourth step of referring to the reconstructed color conversion table to convert the first image data expressed in the  
20           first color system into encoded second image data, which has gone through the encoding process; and

          a fifth step of making the encoded second image data subjected to the decoding process to cancel out the encoding process, thus specifying the second image data expressed in the second color  
25           system.

10. A program stored in a computer readable medium, that

causes a computer to attain an image processing method that converts first image data expressed in a first color system into second image data expressed in a second color system by referring to a color conversion table, said program comprising:

5           a first function of storing the color conversion table representing a mapping of second image data expressed in the second color system to multiple lattice points, at which first image data generated in a color space of the first color system and expressed in the first color system are registered, wherein the color  
10 conversion table is encoded and represents a mapping of encoded second image data to the multiple lattice points, where the encoded second image data are obtained by an encoding process, which enhances a variation in tone value of the second image data in a predetermined tone area in the first color system, while  
15 compressing the variation in tone value of the second image data in a residual tone area;

          a second function of making the color conversion table subjected to a decoding process, so as to generate an intermediate color conversion table, where the decoding process restores the  
20 variation in tone value enhanced or compressed by the encoding process;

          a third function of specifying second image data corresponding to multiple lattice points, which are set to include at least different lattice points from lattice points included in  
25 the intermediate color conversion table, based on the intermediate color conversion table and making the specified second image data subjected to the encoding process, so as to reconstruct the

intermediate color conversion table and generate a reconstructed color conversion table;

a fourth function of referring to the reconstructed color conversion table to convert the first image data expressed in the first color system into encoded second image data, which has gone through the encoding process; and

a fifth function of making the encoded second image data subjected to the decoding process to cancel out the encoding process, thus specifying the second image data expressed in the second color system.